CLAIMS

What is claimed is:

1   1.   A method of compensating for tilt of an optical recording medium, the method

2   comprising:

3   detecting the tilt of the optical recording medium; and

4   compensating a recording signal having a predetermined recording pattern with respect

5   to the detected tilt using a predetermined scheme.

        2.   The method of claim 1, wherein the predetermined scheme comprises adjusting

a power level required for recording the recording signal.

        3.   The method of claim 1, wherein the predetermined scheme comprises adjusting

a time required for recording the recording signal.

        4.   The method of claim 1, wherein said compensating the recording signal

comprises:

        shifting the recording pattern with respect to the detected tilt; and

4   adjusting a power and/or a time required for recording with respect to the detected tilt

5   wherein the size of a recording mark corresponding to the recording signal is compensated.

1   5.   The method of claim 4, wherein

2   the adjusting the power comprises adjusting a write power to compensate a length of the

3   recording mark, and

4   the adjusting the time comprises adjusting a write time to compensate a width of the

5   recording mark.

1 6. The method of claim 5, wherein the write time adjusting comprises adjusting an

2 ending time of a first pulse and/or a starting time of a last pulse of the recording pattern.

1 7. The method of claim 4, wherein the adjusting the power comprises

2 adjusting a write power to compensate a length of the recording mark, and

3 adjusting a write power of a multi-pulse chain of the recording pattern to adjust

4 a width of the recording mark.

1 8. A method for compensating input data for tilt of an optical recording medium,

2 which records marks and spaces by write pulses having a predetermined recording pattern, the

3 method comprising:

4 detecting the tilt of the optical recording medium; and

5 adaptively compensating the recording pattern with respect to the detected tilt using a

6 memory storing data comprising

7 a power and/or a time required for recording to compensate for an amount of

8 shift of the recording pattern, and

9 a power and/or a time required for recording to compensate for a length and a

10 width of recording mark with respect to a detected tilt and/or a length of a recording mark.

1 9. A method for compensating for defocus of an optical recording medium, the

2 method comprising:

3 detecting the defocus of the optical recording medium; and

4 compensating a recording signal with respect to the detected defocus using a

5 predetermined scheme.

1 10. The method of claim 9, wherein the predetermined scheme comprises adjusting

2 a power level required for recording the recording signal.

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1   11.   A method of compensating for a tilt and a defocus of an optical recording

2   medium, the method comprising:

3   detecting the defocus of the optical recording medium;

4   compensating a write pulse with respect to the detected defocus using a predetermined

5   scheme, wherein the write pulse comprises a predetermined recording pattern;

6   detecting the tilt of the optical recording medium; and

7   compensating the write pulse with respect to the detected tilt.

1   12.   The method of claim 11, wherein the predetermined scheme comprises adjusting

2   a power level with respect to the detected defocus.

1   13.   The method of claim 11, wherein compensating the write pulse with respect to

2   the detected tilt further comprises:

3   shifting the recording pattern with respect to the detected tilt by both an amount that the

4   recording pattern was shifted due to the detected tilt, and in a direction opposite to the

5   direction that the recording pattern was shifted due to the detected tilt; and

6   adjusting a power and/or a time required for recording with respect to the detected tilt

7   in order to compensate for a size of a recording mark corresponding to the recording signal.

1   14.   The method of claim 13, wherein

2   the adjusting the power comprises adjusting a write power to compensate a length of the

3   recording mark, and

4   the adjusting the time comprises adjusting a write time to compensate a width of the

5   recording mark.

1   15.   The method of claim 14, wherein adjusting the recording mark width comprises

adjusting an ending time of a first pulse and/or a starting time of a last pulse of the recording

pattern.

1   16.   The method of claim 13, wherein the adjusting the power comprises

2   adjusting a write power to compensate a length of the recording mark, and

3   adjusting a write power of a multi-pulse chain of the recording pattern to adjust

4   a width of the recording mark.

1   17.   A method for compensating input data for a tilt and/or a defocus of an optical

2   recording medium, which records marks and spaces by write pulses having a predetermined

3   recording pattern, the method comprising:

4   detecting the tilt and/or the defocus of the optical recording medium; and

5   adaptively compensating the recording pattern with respect to the detected tilt and/or

6   defocus using a memory, wherein the memory storing data comprising

7   a write power to compensate with respect to the detected defocus,

8   a power and/or a time required for recording to compensate for an amount of

9   shift of the recording pattern, and

10   a power and/or a time required for recording to compensate for a length and a

11   width of recording mark with respect to a detected tilt and/or a length of a recording mark.

1   18.   An apparatus which records and/or reproduces information on an optical

2   recording medium and which compensates for a tilt, the apparatus comprising:

3   a tilt detector which detects the tilt of the optical recording medium; and

4   a recording compensator which compensates a recording signal with respect to the

5   detected tilt using a predetermined scheme, wherein the recording signal comprises a

6   predetermined recording pattern.

1   19.   The apparatus of claim 18, wherein, according to the predetermined scheme,

2   said recording compensator adjusts a power level required for recording the recording signal.

1   20.   The apparatus of claim 18, wherein, according to the predetermined scheme,

2   said recording compensator adjusts a time required for recording the recording signal.

1   21.   The apparatus of claim 18, wherein said recording compensator shifts the

2   recording pattern with respect to the detected tilt, and compensates for a length and a width of

3   the recording mark with a power and/or a time required for recording.

1   22.   The apparatus of claim 21, wherein said recording compensator adjusts the

2   power to compensate the length of the recording mark, and adjusts the time required for

3   recording to compensate the width of the recording mark.

1   23.   The apparatus of claim 21, wherein said recording compensator adjusts the

2   power for recording to compensate the length of the recording mark, and adjusts an ending

3   time of a first pulse and/or a starting pulse of a last pulse to compensate the width of the

4   recording mark.

1   24.   The apparatus of claim 21, wherein said recording compensator adjusts the

2   power required for recording to compensate the length of the recording mark, and adjusts a

3   power of a multi-pulse chain of the recording pattern to compensate the width of the recording

4   mark.

1 25. The apparatus claim 18, further comprising a luminance source which provides

2 the recording signal, wherein the wavelength of said luminance source is equal to or less than

3 approximately 430 nm.

1 26. The apparatus claim 18, further comprising an objective lens having a numerical

2 aperture greater than or equal to 0.6, and wherein the optical recording medium further

3 comprises a substrate having a thickness greater than or equal to 0.3 mm,.

1 27. The apparatus of claim 18, further comprising an objective lens having a

2 numerical aperture greater than or equal to 0.7, and wherein the optical recording medium

3 further comprises a substrate having a thickness less than or equal to 0.3 mm.

28. An apparatus, which records marks and spaces by write pulses having a

predetermined recording pattern, and which compensates for input data for tilt of an optical

recording medium, the apparatus comprising:

a tilt detector which detects the tilt of the optical recording medium; and

a recording compensator which adaptively compensates the recording pattern with

respect to the detected tilt, and further comprising a memory which stores data comprising

7 a power and/or a time required for recording to compensate an amount of shift

8 of the recording pattern, and

9 a power and/or a time required to compensate a length and a width of a

10 recording mark with respect to the tilt and/or the length of the recording mark.

1 29. An apparatus which records and/or reproduces information on an optical

2 recording medium, and which compensates for tilt and/or defocus, the apparatus comprising:

3 a tilt and/or defocus detector which detects the tilt and/or the defocus of the optical

4 recording medium; and

5   a recording compensator which compensates a recording pulse with respect to the

6   detected tilt and/or defocus using a predetermined scheme;

7   wherein the recording pulse comprises a predetermined recording pattern.

30.   The apparatus of claim 29, wherein, according to the predetermined scheme,

2   said recording compensator adjusts a power level required for recording the recording pulse

3   with respect to the detected defocus.

31.   The apparatus of claim 29, wherein, according to the predetermined scheme,

said recording compensator adjusts a power and/or a time required for recording the recording

pulse with respect to the detected tilt.

32.   The apparatus of claim 29, wherein said recording compensator adjusts a write

power with respect to the detected defocus, and generates the recording pulse earlier to

compensate for an amount of shift with respect to the detected tilt, and adjusts a power and/or

a time of the shifted recording pulse to compensate a length and a width of a recording mark.

33.   The apparatus for compensating of claim 32, wherein said recording

2   compensator adjusts the power required for recording to compensate the length of the

3   recording mark, and adjusts the time required for recording in order to compensate the width

4   of the recording mark.

1   34.   The apparatus of claim 33, wherein said recording compensator adjusts the

2   power by adjusting a write power to compensate the length of the recording mark, and adjusts

3   the time by adjusting an ending time of a first pulse and/or a starting time of a last pulse to

4   compensate the width of the recording mark.

35.   The apparatus of claim 32, wherein said recording compensator both adjusts the power by adjusting a write power to compensate the length of the recording mark, and adjusts a power of a multi-pulse chain of recording pattern to compensate the width of the recording mark.

36.   The apparatus of claim 29, further comprising a luminance source which provides the recording pulse, wherein a wavelength of the luminance source is equal to or less than approximately 430 nm.

37.   The apparatus of claim 29, further comprising an objective lens having a numerical aperture greater than or equal to 0.6, and wherein the optical recording medium further comprises a substrate having a thickness greater than or equal to 0.3 mm.

38.   The apparatus of claim 29, further comprising an objective lens having a numerical aperture greater than or equal to 0.7, and wherein the optical recording medium further comprises a substrate having a thickness less than or equal to 0.3 mm.

39.   An apparatus, which records marks and spaces by write pulses having a predetermined recording pattern, and which compensates input data for tilt and/or defocus of an optical recording medium, the apparatus comprising:

a tilt and/or defocus detector which detects the tilt and/or defocus of the optical recording medium; and

a tilt and/or defocus compensator which adaptively compensates the recording pattern with respect to the detected tilt and/or defocus, further comprising a memory storing data comprising

a write power to compensate with respect to the detected defocus,

10   a power and/or time required for recording in order to compensate an amount of

11 shift of the recording pattern, and

12   a power and/or time required to compensate a length and a width of a recording

13 mark with respect to the detected tilt and/or length of the recording mark.

1   40. The apparatus of claim 39, wherein the data stored in the memory comprises

2   a power and/or time and an amount of shift required for recording to

3 compensate when defocus and tilt occur together, and

4   a power and/or time and an amount of shift required for recording to

5 compensate when defocus or tilt occurs.

1   41. A method of compensating for tilt of an optical recording medium, the method

2 comprising:

3   detecting the tilt of the optical recording medium; and

4   compensating a recording signal with respect to the detected tilt using a predetermined

5 scheme.

1   42. A computer readable medium storing a computer program having instructions

2 which, when executed by a processor, cause the processor to perform a method, the method

3 comprising:

4   detecting a tilt of an optical recording medium;

5   and adaptively compensating a recording signal with respect to the detected tilt using a

6 predetermined scheme stored in a memory.

1   43. The computer readable medium of claim 42, wherein the predetermined scheme

2 comprises adjusting a power level required for recording the recording signal.

1   44.   The computer readable medium of claim 42, wherein the predetermined scheme

2   comprises adjusting a time required for recording the recording signal.

1   45.   The computer readable medium of claim 42, wherein said compensating the

2   recording signal comprises:

3   shifting a recording pattern within the recording signal with respect to the detected tilt;

4   and

5   adjusting a power and/or a time required for recording with respect to the detected tilt

6   wherein the size of a recording mark corresponding to the recording signal is compensated.

46.   The computer readable medium of claim 45, wherein

    the adjusting the power comprises adjusting a write power to compensate a length of the

recording mark, and

    the adjusting the time comprises adjusting a write time to compensate a width of the

recording mark.

47.   The computer readable medium of claim 45, wherein the write time adjusting

comprises adjusting an ending time of a first pulse and/or a starting time of a last pulse of the

recording pattern.

1   48.   The computer readable medium of claim 44, wherein the adjusting the power

2   comprises

3   adjusting a write power to compensate a length of the recording mark, and

4   adjusting a write power of a multi-pulse chain of the recording pattern to adjust

5   a width of the recording mark.

49.   A computer readable medium storing a computer program having instructions

which, when executed by a processor, cause the processor to perform a method, the method

comprising:

    detecting a defocus of an optical recording medium; and

    adaptively compensating a recording signal with respect to the detected defocus using a

predetermined scheme stored in a memory.

50.   The computer readable medium of claim 49, wherein the predetermined scheme

comprises adjusting a power level required for recording the recording signal.

51.   A computer readable medium storing a computer program having instructions

which, when executed by a processor, cause the processor to perform a method, the method

comprising:

    detecting a defocus of an optical recording medium;

    adaptively compensating a write pulse with respect to the detected defocus using a

predetermined scheme stored in a memory;

    detecting a tilt of the optical recording medium; and

    adaptively compensating the write pulse with respect to the detected tilt using the

predetermined scheme.

52.   The computer readable medium of claim 51, wherein the predetermined scheme

comprises adjusting a power level with respect to the detected defocus.

53.   The computer readable medium of claim 51, wherein compensating the write

pulse with respect to the detected tilt further comprises:

3   shifting a recording pattern within the write pulse with respect to the detected tilt by

4   both an amount that the recording pattern was shifted due to the detected tilt, and in a direction

5   opposite to the direction that the recording pattern was shifted due to the detected tilt; and

6   adjusting a power and/or a time required for recording with respect to the detected tilt

7   in order to compensate for a size of a recording mark corresponding to the recording signal.

1   54.   The computer readable medium of claim 53, wherein

2   the adjusting the power comprises adjusting a write power to compensate a length of the

3   recording mark, and

4   the adjusting the time comprises adjusting a write time to compensate a width of the

5   recording mark.

55.   The computer readable medium of claim 54, wherein adjusting the recording

mark width comprises adjusting an ending time of a first pulse or a starting time of a last pulse

of the recording pattern.

56.   The computer readable medium of claim 53, wherein the adjusting the power

comprises

      adjusting a write power to compensate a length of the recording mark, and

4   adjusting a write power of a multi-pulse chain of the recording pattern to adjust

5   a width of the recording mark.

1   57.   A method of compensating for defocus and/or tilt of an optical recording

2   medium, the, method comprising:

3   detecting a defocus of an optical recording medium;

4   compensating a write pulse with respect to the detected defocus using a predetermined

5   scheme;

6   detecting a tilt of the optical recording medium; and

7   compensating the write pulse with respect to the detected tilt.